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Launch Opportunities for Standardized Payloads 25-80 kg

***The 17th Annual Small Payload Rideshare
Symposium***

June 9-11, 2015

***Johns Hopkins University Applied Physics
Laboratory***

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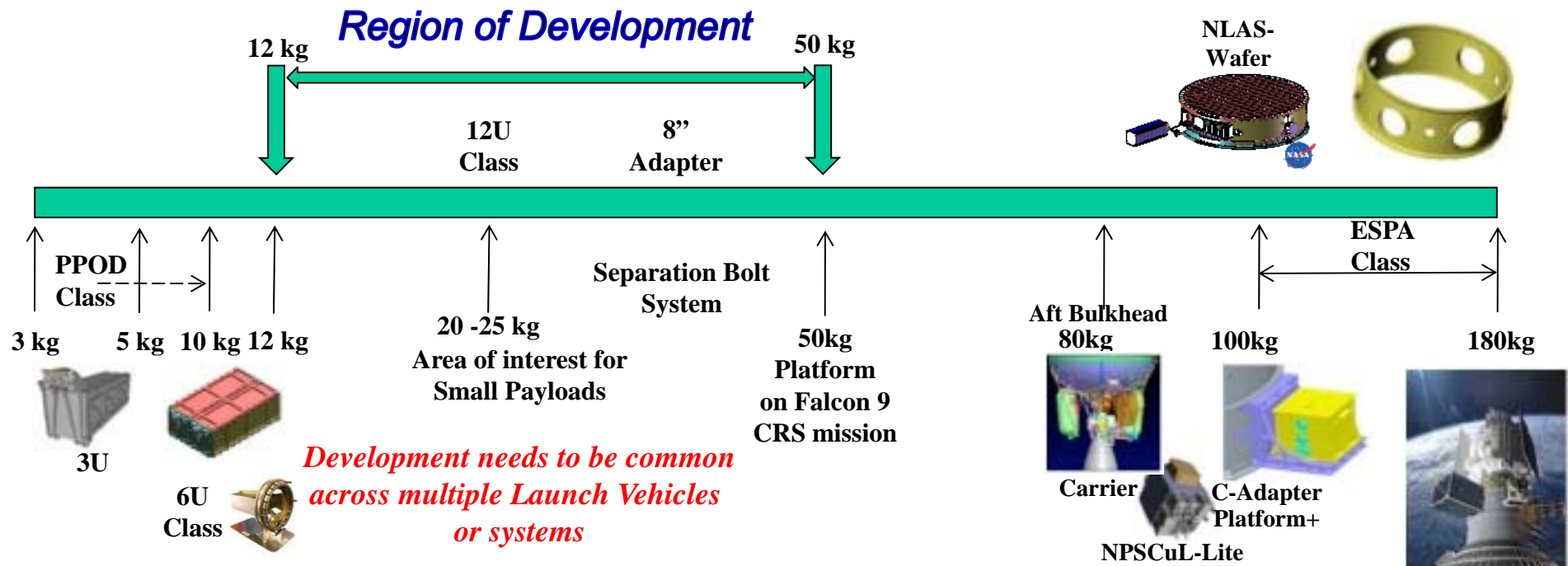
Small Payload Capabilities



LSP considers rideshare or small/secondary payloads as those payloads in the 1 kg to 180 kg range

- Payloads above 150 kg could fly as a small payload on a commercial launch vehicle

The diagram below shows the current capabilities that have flown or are scheduled to fly in the near future





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Small Payload Standard



How do we develop small payload systems to be common across multiple Launch Vehicles?

Current Launch Vehicles?

New Nano/Micro Launch System?

Can a Standard for small payloads be developed?

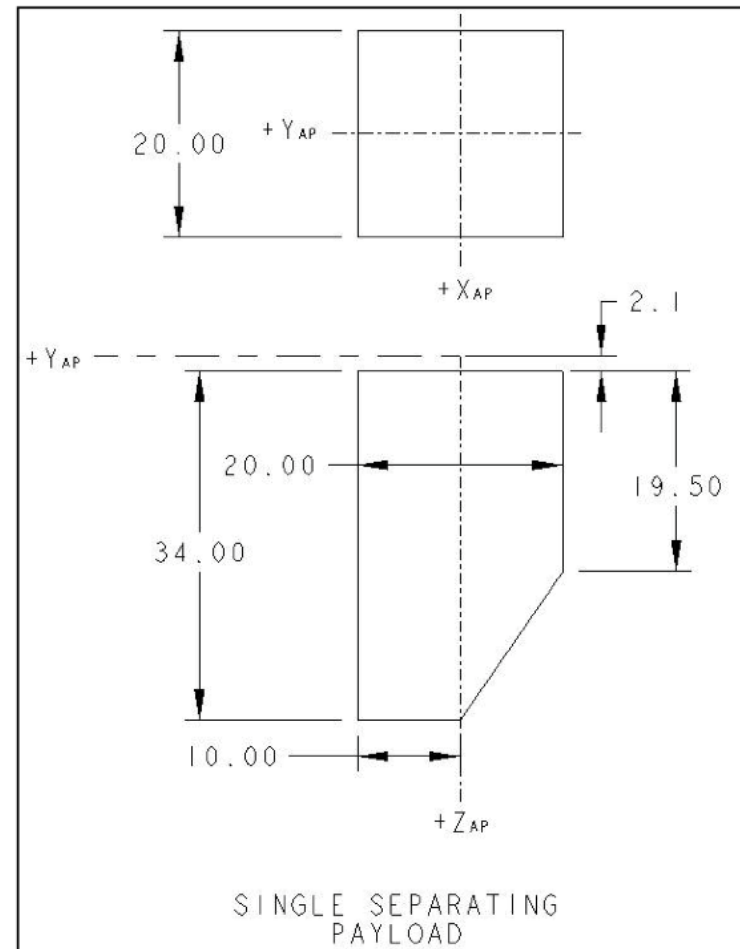


Diagram from ULA ABC User Guide for secondary payloads



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Atlas ABC

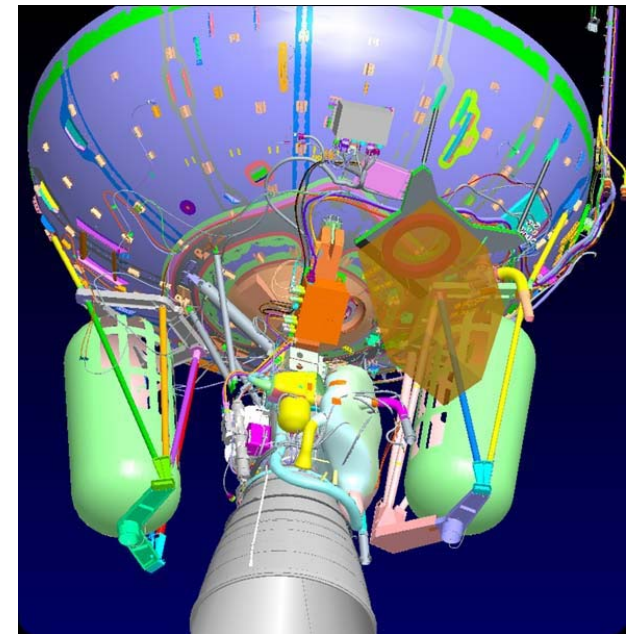


Atlas has flown three missions using the NPSCul system and has plans for a fourth later this year

Atlas will be launching two 6U on the ABC on the InSight mission next year, staying within envelop volume of the ABC system

So should this volume be identified as a potential standard to stay within?

20" x 20" x 19.5" at ~80 kg





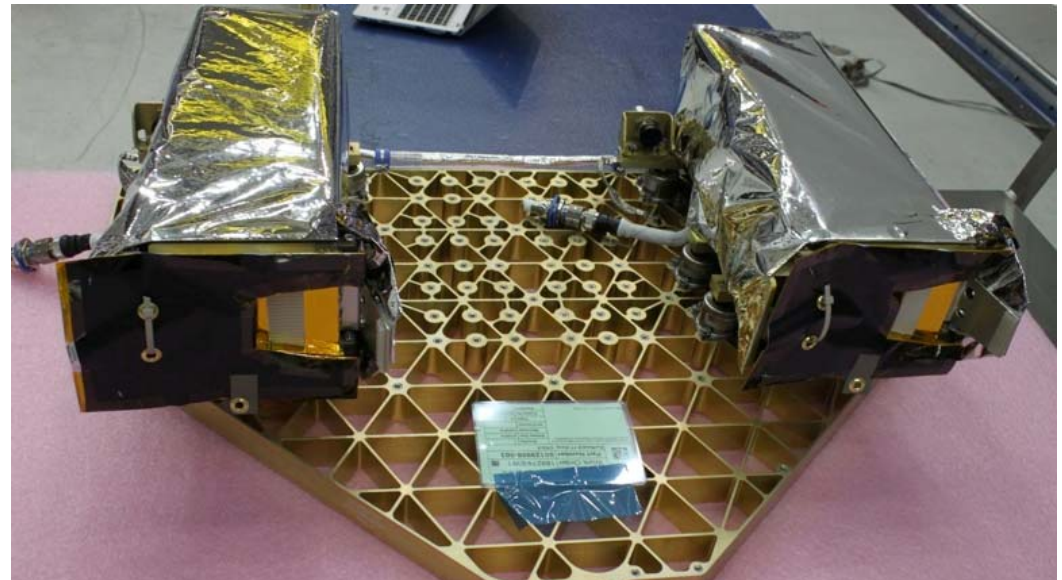
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Falcon 9 Surf Board



So...could this type of spacecraft be attached to the SpaceX Falcon 9 Surf Board configuration?

Not sure...would need to perform a study to determine the volume envelop, which type of separation system could be used and what is the max allowable mass





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Nano/Micro Launchers



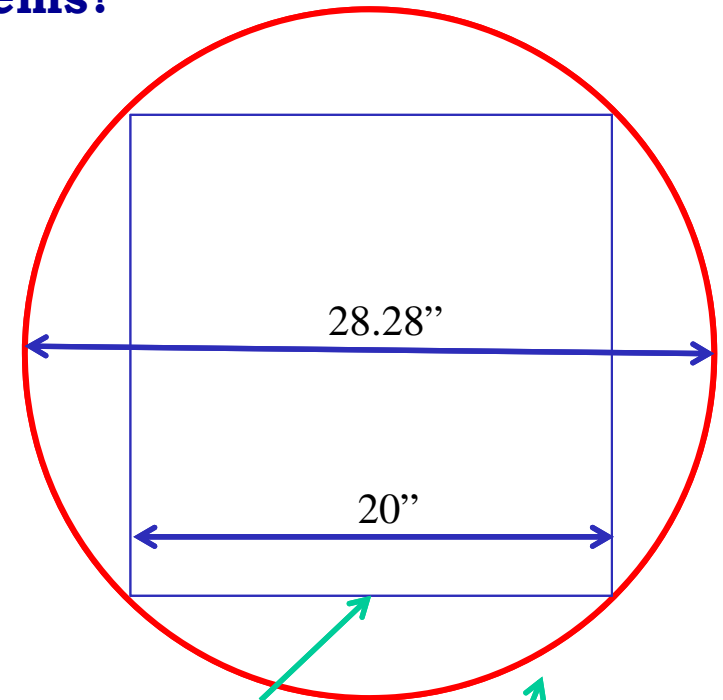
How about potential Nano/Micro Launch systems?

LSP is moving forward with a Strategic initiative to targeted SMD requirements for Earth Venture (EV) missions with the possible use of a Nano/Micro Launch system

CSLI CubeSats will be launched under FAA license to demonstrate how one 60 kg or two 30 kg spacecraft could be launched for Earth Venture missions on a future contract

Will have to see what is proposed in the form of available volume envelops for Nano/Micro Launch systems

Fairing envelop could drive a potential standard if we want to have multiple launch opportunities



Atlas ABC Envelop

Needed Envelop for Nano Launcher



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Closing



- **As a Rideshare community, should we have a standard for Small Payloads to take advantage of multiple launch systems in the 25 – 80 kg class?**
 - **Have a maximum envelop volume that the S/C will stay within**
 - » **May be in a form factor of a U-class payload**
 - » **A Standard Interface**
 - **Move away from the canister dispenser and start to use other separation systems**
 - » **8” Clamp Band**
 - » **Separation Bolt System**
 - **Reduce Cost of integration**
 - » **Some type of standardization will bring down cost of launch**
 - **Have multiple launch systems to be manifested on increased launch opportunities**
 - » **If there is no Atlas opportunity there may be a Falcon launch that accepts the standard interface**

